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Capital Controls and International Interest Rate Differentials

*Makram El-Shagi**

Abstract: The literature on interest rate differentials caused by capital controls is mostly case based yet**.** The present paper tries to find general evidence how large the interest rate differentials – and thus the distortions of capital markets – actually are. Advocates of capital controls generally argue, that capital controls (should) affect capital flow composure rather than the total, analogue to Tobin's idea concerning currency markets only. Based on a new measure for capital controls, which is including information on the direction of the flows, which are subject to the control, it is shown here with a sample of 86 countries from 1997 to 2003, that the interest rate effects are to severe to sign this assumption. The results indicate, that capital controls, as they are commonly employed, have significant impact on interest rates, hence risking accordingly high growth impeding effects.

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Keywords: Capital controls, financial openness, interest rates

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I Introduction

The discussion of the interest rate effects of capital movement restrictions has a long tradition. While it might first seem obvious, that capital controls allow for deviations from the interest rate parity, this is not necessarily true. E.g. Desai, Foley and Hines (2004) argue, that substitution effects between controlled and uncontrolled asset flows in conjunction with the fact, that at least major multinational enterprises have means to circumvent controls by inter-enterprise actions, are sufficient to cancel most of the impact of capital controls.

Surprisingly the main focus of the literature dealing with interest rates and capital movement restrictions is case based, and hence, though the special cases of several specific capital account restrictions are well discussed (e.g. by Dooley, Isard (1980) for the controls in Germany in the early 70s; Ito(1983 and 1987) for interest rate differentials between Japan and the US; Herrera, Valdés (2001) for the case of the often discussed Chilean controls of the early 90s), few emphasis has been put yet into a more generalized analysis.

This is especially surprising, since cross country and panel data studies concerning capital controls are en-vogue for some years now. This is probably mainly due to the seminal works by Quinn (1997, 2000 and 2001) concerning financial openness and Gwartney, Lawson (2003), where capital controls where first measured quite detailed for a panel of sufficient length and width. Earlier papers where almost entirely based on a single dummy as a catch-it-all-variable for capital controls, which has been published in the Annual Report on Exchange arrangements and Exchange Restrictions by the IMF for several decades. The lack of detail in the data made it hard to prove any findings beyond political issues. Especially the question, where there is a general tendency to use or not to use financial market regulation is debated in this context(see e.g. Alesina, Grilli,

Milesi-Ferretti (1993), where the authors were able to show the likeliness of capital controls being imposed under different regimes, but also found an annoying lack for any impact on growth that should intuitively exist). The presumably most quoted panel analysis is Rodrik's 2001 paper "Who needs capital account convertibility?", where he believes to prove the lack of growth impact of financial openness using data, which is completely inadequate for panel analysis with such sophisticated questions.

The present paper attempts to use data on capital controls, where – according to the author's knowledge – for the first time a measurement of capital controls is used, which does not only distinguish between different control intensities in general (as Quinn and Gwartney, Lawson do) , but does so for different kinds of control separately. Prime focus of the paper shall hence be, to discuss the interest differentials, which are possible – or sometimes not possible - due to different kinds of capital controls.

The rest of the paper is structured as followed. Section II discusses the data set employed. In section III the basic model, which shall be tested, will be derived. The final three sections discuss the empirical findings (section IV and V) and the conclusions of these (section VI).

II The Data

(a) Measuring Capital Controls

The problems, faced by numerous papers on this topic yet, show, that it is all but trivial to handle capital controls econometrically. Especially, when controls shall be analyzed for a broader choice of countries, several problems might arise. These problems include for example the fact, that there is a great lot of instances, where capital controls are not implemented separated from other policies, which are relevant for the discussed dependent variables but as part of a larger political packet solution (see e.g. Forbes, 2004). Though, this problem might be considered minor, because the additional meas-

ures are usually going into the same political direction – i.e. liberalization or intervention – what means, that the worst distortion one might face is, that the results should not only be applied to capital movement controls but to controls as a whole.

Another problem, that usually arises when analyzing political variables, is to distinguish "de jure" and "de facto" values of the tested variable. (For am more detailed discussion see Obstfeld, Shambaugh, Taylor, 2004, p. 9 f.) Luckily in the special case of capital controls large deviations of "de facto" from "de jure" controls seem unlikely, because controls – if not based on law – are hardly to sustain, for there are no options of daily capital control policy (without the need to change a law) that can be used to control, like this might be done with monetary policy for example.

But the central problem, which is the availability of data, remains. As already mentioned empirical studies with the intention to include a broad range of countries or a long period have to rely on one dummy alone catching all the different aspects of capital controls.[1] Such data is only a good choice to analyze the most simple questions. The granularity of data is hiding such a great lot of economically relevant information that it is near to impossible to research the causes of an effect. Merely basic information e.g. concerning the frequency of controls can be derived.

Many authors – for example Quinn as well as Gwartney/Lawson – attempted to generate control indices, comprising additional information mainly based on the Annual Report on Exchange Arrangements and Exchange Restrictions published by the IMF. Quinn (1997) was the first to base an analysis of capital controls on a more detailed variable. His analysis catches quite a long time horizon (from 1950 to 1989) but only for 61 of the IMF members. Different from this approach Gwartney and Lawson include all IMF countries but as a drawback their index is only available from 1970 onward.

[1] This statement refers to panel studies only. Studies which are only dealing with one country usually employ more detailed capital control measures as for example done in Goh(2005).

Though the big advantage of this index is, that is even shows more of the details than Quinn's.[2] [3]

Since 1996 the situation concerning data availability improved significantly. In the year 1996 the IMF started to report 13 kinds of capital controls in the appendices to the annual report and discusses these kinds of capital controls even further in the text. So for the past years data is available for over 170 countries distinguishing controls not only based on market but also based on the direction of capital flows and the subjects attempting the deal. This makes it possible to analyze some central economic problems concerning capital flows, which are usually fruitless to be discussed without exactly this information, especially without information concerning the direction of the controlled capital flows.

The information concerning anything beyond the direction of the flows might at the first glance seem an information overload for most questions, but further analysis quickly shows, that the acting economic subjects are actually very important in some instances. Having a closer look at capital outflows shall be taken as proof. Imagine outflow controls for locals. This does more or less close foreign markets for residents, giving the domestic capital markets an advantage. If the local situation is not so unpromising, that the local potential investors decide to cease investing, those investors who pre-

[2] The Gwartney-Lawson-Index as it is indented to be can only be calculated since 1996 when the IMF started to publish 13 different kinds of capital controls separate. The index is calculated as the fraction of controls implemented in a given country multiplied by 10 and is therefore ranging from 0 (unregulated) to 10 (highly controlled). The data for the earlier periods is derived from the text part of the annual reports as good as possible. Though an exact match is not possible, Gwartney and Lawson show with data from the later years that the correlation between the two kinds of calculating the index is greater than 0.9, what makes the index quite reliable for the time from 1970 to 1995 as well.

[3] A further critique of several approaches to measure the intensity of capital controls is found in Eichengreen(2001).

vious to a control would have invested in foreign markets will now probably invest in their own economy. Outflow controls for foreigners, i.e. backflow controls, are a completely different matter. Opposite to controls limiting the investment choice of locals, an outflow control hindering the outflow of capital invested by nonresidents (below labeled backflow controls), as it has been imposed in Malaysia for example, will probably rather reduce the total investment within the country than increase it. Most investors from other countries will include the lock-in effect and the rising risk in their calculations and shift their investments to other competitor countries. To account for this problem but keep the number of variables manageable for the further analysis the following four classes of controls shall be distinguished: portfolio inflow controls, portfolio backflow controls, outflow controls on domestic capital and controls on direct investment within the country.[4] For each of the four categories control intensity is measured analogue to the Gwartney-Lawson-index, i.e. using a 0 to 10 scale to which single controls contribute equally weighted. Because the fdi-control-index is actually composed out of one dummy it can only switch between 0 and 10. Though it is rescaled to ease comparison with the effects of other controls.

After all it has to be resumed that certain distortions can never be prevented entirely. Though the fuzziness of a combination of indices like the one, which shall be used here, is distinctly smaller than the fuzziness of a single dummy due to the disaggregation of the data, there there are still some minor gaps in the data. For example strictly upheld

[4] The kind of capital transaction real outflow controls (in the sense that they are applied to the outflow of domestic capital) is not matter of class building here. As a matter of fact even portfolio capital that was subject to an outflow is more likely to be reorganized within the global capital market than being retransferred to the original country in the short run. Therefore it is no major concern for what kind of investment leaves the country but if investments leaves the country at all.

controls in few markets might have a stronger impact than broadly employed controls which can easily be circumvented by means of derivative deals.[5]

(b) The Real Interest Rate

One of the major aims in the present paper is to give a broad range of countries for analysis, so that it can be taken as granted, that the derived results are generally valid and not only the effect of some special kind of control. The drawback of this is, that countries are included in the sample, where the variety of possible investments is limited compared to the major industrialized countries of the OECD, which where the sample of most interest rate differential studies yet. While this makes it impossible or at least unwise to chose a specific kind of investment as matter of comparison as it is often done, an allover measurement for the economies rate of returns has to be used.

For the purpose of the present paper an unweighted geometrical average of deposit interest rate $r_{deposit}$ and credit interest rates r_{credit} as published by the Worldbank in the World Development Indicators in an annual sequence shall be employed as nominal interest rate. To calculate the real interest rate (r) the GDP deflator (π) (also used as published in the WDI) is used. Due to the partially extremely high inflation rates in several of the countries in the sample the simplified Fisher equation is not employed but real interest rate is calculated exactly as:

$$(1+r)=\sqrt{\frac{(1+r_{deposit})(1+r_{credit})}{(1+\pi)}}$$

[5] Notice that this is not a classical de-jure vs. de-facto comparison, where the question is, in how far certain rules are really enforced. Much more the question is of relevance, if rules can be circumvented. Because the search of alternatives usually carries its own costs, there is a certain hindering effect of a control even if it can be circumvented, meaning that the impact of this problem is only minor compared to a de-jure-de-facto-problem.

To compile the real interest rate that way, i.e. without regard to the exchange rate development is one of the advantages of the otherwise data-enforced annual period of the present analysis. Knowing that the (relative) purchasing power parity is roughly holding in the long run, inflation is entirely sufficient to adjust between real and nominal rates for national and international purposes.

(c) The sample

The time horizon of the sample is restricted by the availability of adequate capital control data. Due to slight changes in the mode of report the dataset starts in 1997 reaching to 2003. For these seven years all 86 countries are analyzed, for which gdp deflator, interest rates and capital controls are reported for at least some years in the employed datasets. Additional to a broad range of middle income countries the sample includes 27 nations, which are classified rich, and 15 low income nations. The regional distribution includes all continents, Africa being slightly underrepresented, due to the great lot of low level income countries, where the data situation is obviously very limitng.

III The Model

Two problems have to be faced, if interest rates or interest rate differences shall be employed as indicators for capital market foreclosure, both of these have to do with risk.

As mentioned briefly one of the major problems is the correction for the risk premium that has to be paid by the analyzed economies. Not only inflation risk is a major influence here but as well the country specific risk of default (which is only in cases of home currency denominated debt measuring roughly the same). It has to be kept in mind that all this does only apply, if one believes investors to act risk averse, that is, that the risk premium does exceed the expected losses from realized risks. Otherwise risk would only increase variance, hence decreasing significance and R^2.

The second problem, which has to be dealt with, is inflation itself. Besides its risk factor inflation risk, when fulfilled, might cause a difference between expected (i.e. ex ante) real interest and the realized (i.e. ex post) real interest rate. This might result in very low real interest rates in countries with surprisingly high inflation and vice versa, without this difference being caused by capital market foreclosure at all.

Thus the interest rate model used, has to include this effect causing ex ante and ex post values of the interest rate to diverge.

Real interest rate *r*, as it is used here is defined by the equation:

$$(1) \qquad (1+r_{t,i})=\frac{(1+R_{t,i})}{(1+\pi_{t,i})}$$

$R_{t,i}$ being the geometrical average of deposit and credit interest rates in country *i* in period *t* and $\pi_{t,i}$ being the GNP deflator in country *i* in period *t*. That means, that the nominal interest rate, as it is measured, can be written as follows based on ex post variables.

$$(1') \qquad 1+R_{t,i}=(1+r_{t,i})(1+\pi_{t,i})$$

Though, as it is well known, this nominal interest rate does not necessarily reflect the intended real interest rate, due to the already mentioned errors in inflation rate expectations. Much more the nominal interest rate in its origin is based on the following formula using ex ante variables.

$$(2) \qquad 1+R_{t,i}=(1+r_{t,i}^{planned})(1+\pi_{t,i}^{expected})$$

Thus, when $\pi_{t,i}^{expected}$ and $\pi_{t,i}$ diverge, $r_{t,i}^{planned}$ and $r_{t,i}$ are bound to do so as well. Two further assumptions, which are indisputable simplifying but should nevertheless reflect reality sufficiently, allow to convert this into the base of the hence used econometric model.

The first of these assumptions is, that is unlikely for $\pi_{t,i}^{expected} - \pi_{t,i}$ to be correlated between the different countries. When the average difference between expectations and reality is zero, the average real interest rate of the low risk countries should equal the planned real interest rate for low risk assets.

Furthermore a fairly simple expectation model shall be employed, substituting inflation expectation by the inflation of the preceding period.

(3) $$r_{t,i}^{planned} = r_t^{avg}$$

(4) $$\pi_{t,i}^{expected} = \pi_{t-1,i}$$

r_t^{avg} is fort his purpose defined as the unweighted average real interest rate of a set of OECD countries with especially few capital controls.

(3) and (4) inserted in (2), then equating with (1') leads to the following equation:

(5) $$\frac{(1+r_{t,i})}{(1+r_t^{avg})} = \frac{(1+\pi_{t-1,i})}{(1+\pi_{t,i})}$$

This is valid in the absence of capital market regulation of any kind or any other factors causing the real interest rate to diverge from its international optimum, like e.g. the existence of a homebias.

Two major effects, causing this equation not to hold, have already been mentioned. First of all there are capital market restrictions, which allow the domestic planed interest rate to differ from the global one, as the capital movement restrictions, which are the focus of the present analysis.

Additionally a way has to be found to integrate the distortion, which is caused by a risk premium.

While rating agencies provide sovereign risk ratings, which are – due to their so called sovereign ceiling function – an often employed proxy for the risk of privates in a

given economy, their employment proves difficult here. First of all not all countries are rated by all agencies, which limits the set of available countries quite substantially. Additionally the ratings often change quite fast within one year, making it quite hard to determine the risk for a given year. This is especially problematic because these changes are often done, after first risks have actually been realized. That is, that in many cases the paradox result might occur, that an effect, which should result in an increased risk premium, makes the real interest rate fall. And last but not least capital market foreclosure is increasing the risk of a fair share of assets of a country; hence it is very likely that there is a correlation between sovereign risk rating and the existence of some kinds of capital controls. Especially this last point makes the sovereign risk rating (or any version of such ratings, rescaled to match an cardinal scale) an unlucky choice for the present analysis.

Thus other means have to be found to control for risk and other effects affecting the real interest rate. Here a set of income dummies shall be employed, based on the world banks division of countries in low, middle and high income groups. This is a way of at least catching the general risk (and its interest rate effects) of being on certain point on the scale of economic development without catching the effects of policy variables (like capital controls) as it would be likely when employing the otherwise more precise fixed effects for each country separately.

The econometric model to be tested here thus is:

$$(6)\quad RDIFF_{t,i} = \begin{array}{l}\beta_0 INFDIFF_{t,i} + \beta_1 LOWINC_i + \beta_2 MIDINC_i + \beta_3 CMRINF_{t,i} \\ + \beta_4 CMROUT_{t,i} + \beta_5 CMRBCK_{t,i} + \beta_6 CMRFDI\,t,i + \varepsilon_{t,i}\end{array}$$

RDIFF the natural logarithm of the interest rate differential, INFDIFF equals the natural logarithm of $\frac{1+\pi_{t-1,i}}{1+\pi_{t,i}}$. While it would be possible to test on actual and past inflation rates separately in the log form this seems unsuitable, due to the doubtlessly high correlation between the two time lagged inflation rates.[6] No constant is estimated because the interest rate of an industrialized country, with stable money markets, without capital controls actually should not (and usually does not) diverge from the mean of these countries. The reason that logs and not absolute values are used is, that total capital market foreclosure should impact interest rate differentials very strong compared to limited foreclosure due to the fact, that investment substitution becomes less likely.

IV The empirical findings

As it had to be expected the R^2 of the regression is rather low with 13%.[7] Nevertheless a result like that is neither problematic nor surprising, when dealing with such economic variables, where so many disturbances occur, without using the lagged variable or fixed effects as a major independent variable.

All variables, but the capital movement restrictions concerning FDI, have highly significant impact on the independent variable. As expected the sharply decreasing or increasing inflation is a major factor, when determining real interest rates. Income respectively development dummies are positive, which might be due to a risk premium as well as (or combined with) generally higher capital productivity in economies with a low capital stock (though the latter argument would be futile on perfect capital markets).

[6] The correlation coefficient after Pearson between $\ln(1+\pi_{t-1,i})$ and $\ln(1+\pi_{t,i})$ is slightly above 75 percent.

[7] Full results are found in the appendix.

The strongest impact among the control variables is shown by inflow controls. The lack of available capital caused by such controls in the concerned countries increases the cost of capital – and hence real interest rate – significantly. Vice versa outflow controls, increasing the available capital within the country, have the opposite effect of lowering the interest rate. The strength of backflow controls is about half as strong, what had to be expected due to the unwelcome side effect of preventing capital entrance once employed. So one of the major drawbacks of backflow controls – as employed in Malaysia – becomes obvious here quickly. While capital might be struck in the country short run, hence improving capital supply, the long run effect contradicts this result and limits the usefulness of this kind of control drastically. The lack of significance in the FDI-only controls had to be expected and is most likely primarily due to the ease of b such bypassing such controls by substituting it with portfolio investment.

The clear significance of the other variables shows how much capital controls actually hamper capital movements. Although a certain share of controls is possibly evadable they clearly affect the interest rate as one of the economic key variables.

In developing countries the impacts might even be larger, than suggested by this basic regression. A major part of the development dummies estimated for developing countries, which has yet been interpreted as risk premium, might be due to interest rate markups which are caused by the capital controls, which are more frequently observed in these countries. The reason, that an development like this is observed, is, that taxes do not affect winning and loosing situations symmetrically and hence variance is not – as one might think – without impact on the expected value of the total returns as Herrera, Valdés (2001) show.

A closer look at the analyzed data reveals that the measured impact of capital controls is almost entirely due to the effect it has in middle income countries. While the ef-

fects in rich economies as the OECD countries and some others bear the right sign they are almost negligibly small and hence barely significant at all.

While this matches the expected results the poorest countries of the world to not show greater interest rate effects due to controls like the analyzed ones. The least developing countries are most likely exposed to such a variety and mass of economic shocks and political instability, that variables like capital controls do only account for a minor fraction of risk and rent considerations and are hence not of great importance.

V Some remarks on positive and negative interest rate differentials

It might seem unusual, that such a great lot of thought is given to interest rate differentials caused by capital controls. But it is fairly obvious that engaging in policies, which influence interest rates, means nothing but to tamper with investment and hence with one of the key variables, determining long term growth chances.

While attempts to increase the interest rate do almost certainly reduce investment, and capital controls attempting to do so, have to be considered as the attempts to sacrifice growth for stability, the reverse is not necessarily true. Countries, which find outflow restrictions highly attractive, are most certainly countries, suffering from what they perceive to be massive capital outflows. The wording indicating that the cause of their suffering is only perceived to be the extent of outflows is chosen intentionally. These countries experience outflows, but they actually suffer from unrentable investment opportunities in their economies. These lacks of investment opportunities are causing the outflows. Knowing that a huge home bias exists, that makes domestic investment even more likely than foreign investment, if there are no artificial restrictions to capital movements, it is quite clear, that the differentials in asset rentability are significant. This implies that capital controls, allowing the policy to sustain negative interest rate differen-

tials compared to the big industrialized nations dominating the global capital market are not necessarily sufficient to improve investment.

A rate of return, which is so low, that people wish to invest outside the domestic economy so very much, that policy sees the necessity to react, indicates a kind of situation, which is similar to the Keynesian investment trap situation. Domestic investors are more likely to substitute foreign investment with hoarding than with investment in the domestic economy. A first look at the most outflow controlling countries quickly reveals that almost each of the 54 countries, which controlled capital outflows in all the six markets (being the foundation for the INFLOW index) in 2003, is among the least developed countries of the world. While the entire OECD is part of the sample, just one OECD country – the Netherlands – is part of this highly controlling group. Interest rate changes due to outflow controls in these countries are possibly not as much caused by rising capital supply in the domestic economy, as by the central bank's or government's attempts to lower interest rates under the international equilibrium rate, which is possible under the control regime. While the costs of this kind of capital control, namely the sacrifice of additional income due to the relatively higher international return on investments, do apply completely, the hoped result of increasing capital supply domestically to force the economy on a higher growth path is arguable.

Although positive growth effects are unlikely, one has to admit, that another motivation behind a governments wish to decrease interest rates, which is, that it is cheaper to finance budget deficits, is perfectly working, as it has been mentioned e.g. by Wyplosz (1999).

VI Conclusions

The impact of capital controls on domestic capital market is stronger than one might have thought, knowing the seminal study of Feldstein and Horioka (1980), where the

home bias has been discussed in some depth for the first time. Given the fact, that recent studies (e.g. by the Deutsche Bundesbank, 1997) show, that still today – though information costs and other transaction costs have fallen due to the rising of the so called "new economy" - the home bias is strong even among only lightly controlling nations, the herein found results are even more alarming. Although even unrestricted capital markets are not fully integrated, the additional barriers in the form of capital controls obviously have significant impact.

Though there has been evidence, that a fair share of capital movement restrictions is easily avoided by investors, it became clear, that controls have a strongly distorting effect on allocation. At least those economies, which do not have severely underdeveloped institutions, don't seem to be well advised, when trying to "protect" themselves by steering capital flows.

Most of the discussion among economists concerning capital controls is based on the seminal idea first brought up by Tobin(1978) for the special case of currency as analyzed asset, i.e. a capital control that is severe enough to hamper chart based speculation but not severe enough to affect aggregate investment significantly. But this does not seem to be economic reality. At least the kind of capital controls that is promoted by serious economic scientists does not have in mind, to hamper with the optimum allocation of capital or the global interest rate structure in a longer run. Much more the intended sense of this kind of control is to level the capital inflow and outflow peeks, hence lowering volatility of short term flows and therefore limiting the negative impact of investment "valleys", which are not due to negative fundamentals but to speculative attacks. It is almost unbelievable, that the impact of capital controls, remains restricted in this way, looking at the significant interest rate distortions caused. Given the differentials , which can be observed due to capital market restrictions, it is utterly impossible to deny, that there is a harmful amount of misallocation beyond the indented function of smoothing

capital flows and restructuring their composure. Keeping in mind, that this macroeconomic point of view does not even include other major drawbacks of capital market regulation like increased corruption, the proposal to reduce controls as much as possible (developed capital markets given) can be made without having discussed direct growth impacts here.

VII References

Alesina, Alberto; Grilli, Vittorio; Milesi-Ferretti, Gian Maria (1993): The Political Economy of Capital Controls, NBER Working Paper 4353.

Desai, Mihir A.; Foley, C. Fritz; Hines Jr., James R. (2004): Capital Controls; Liberalizations, and Foreign Direct Investment, NBER Working Paper 10337.

Deutsche Bundesbank (1997): Die Bedeutung internationaler Einflüsse für die Zinsentwicklung am Kapitalmarkt, in: Deutsche Bundesbank Monantsbericht Juli 1997.

Dooley, Michael P.; Isard, Peter (1980): Capital Controls, Political Risk and Deviations from Interest Rate Parity, in: Journal of Political Economy 88(2), pp. 370 – 384.

Eichengreen, Barry (2001): Capital Account Liberalization: What do Cross-Country Studies tell us?, in: The World Bank Economic Review 15(3), pp. 341 – 365.

Feldstein, Martin; Horioka, Charles Y. (1980): Domestic Savings and International Capital Flows, in: The Economic Journal 90(June 1980), pp. 314 – 329.

Forbes, Kristin J. (2004): Capital Controls: Mud in the Wheels of Market Discipline, NBER Working Paper 10284.

Goh, Soo Khon (2005): New empirical evidence on the effects of capital capital controls in the composition of capital flows in Malaysia, in: Applied Economics 37(13), pp. 1491 – 1503.

Gwartney, James; Lawson, Robert (2003): Economic Freedom of the World: Annual Report 2003, Toronto.

Herrera, Louis O.; Valdes, Rodrigo O. (2001): The effect of Capital Controls on Interest Rate Differentials, Journal of International Economics 53(2), pp. 385 - 398.

Ito, Takatoshi (1983): Capital Controls and the Covered Interest Parity between the Yen and the Dollar, CER Discussion Paper Nr. 83-180.

Ito, Takatoshi (1987): Capital Controls and the Covered Interest Parity, NBER Working Paper 118.

Obstfeld, Maurice; Shambaugh, Jay C.; Taylor, Alan M. (2004): The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility, NBER Working Paper 10396.

Quinn, Dennis P. (1997): The Correlates of Change in International Financial Regulation, in: American Political Science Review 91(3), S. 531 – 551.

Quinn, Dennis P. (2000): Democracy and International Financial Liberalization, Working Paper.

Quinn, Dennis P.; Woolley, John T.: Democracy and National Economic Performance: The Preference for Stability, in: American Journal of Political Science 45(7), pp. 634 – 657.

Rodrik, Dani (1998): Who needs Capital-Account Convertibility?, in: Kenen, Peter B., et. al.: Should the IMF Pursue Capital-Account Convertibility, New Jersey.

Tobin, James (1978): A Proposal for an International Monetary Reform, in: Eastern Economic Journal 4(3-4), pp. 153 – 159.

Wyplosz, Charles (1999): Financial Restraints and Liberalizion in Postwar Europe, CEPR Discussion Paper No. 2253.

Appendix: Result tables

Table 1: Full sample

(Dependent Variable: RDIFF)

	Non-standardized Coefficients		Standardized Coefficients	T	Significance
	β	Standard Error			
INFDIFF	,307	,061	,216	5,004	,000
LOWINC	,052	,016	,148	3,254	,001
MIDINC	,033	,008	,222	3,872	,000
CMR_IN	,011	,003	,440	3,826	,000
CMR_OUT	-,009	,002	-,430	-4,234	,000
CMR_BACK	-,005	,002	-,290	-2,832	,005
CMR_FDI	-,001	,001	-,070	-1,188	,235

R	R-Square	Adjusted R-Square	Standard error of estimator
0,38	,142	,130	,10385

Table 2: Middle income sample

(Dependent Variable: RDIFF)

	Non-standardized Coefficients		Standardized Coefficients	T	Significance
	β	Standard Error			
INFDIFF	,231	,090	,143	2,559	,011
MIDINC	,070	,014	,508	5,058	,000
CMR_IN	,015	,005	,497	3,124	,002
CMR_OUT	-,012	,004	-,509	-3,180	,002
CMR_BACK	-,010	,003	-,439	-3,127	,002
CMR_FDI	-,004	,002	-,216	-2,384	0,02

R	R-Square	Adjusted R-Square	Standard error of estimator
,432(b)	,186	,168	,12579

Capital Controls and International Interest Rate Differentials

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Abstract: Since the Asian crises it is often taken as granted that capital markets have significant functional deficits. Often these deficits are believed to be so very strong, that the ability of free capital markets to guarantee a more or less correct international allocation of capital is denied. It is argued that speculation dominates capital markets so much, that capital allocation is purely random. This is one of the major arguments backing the present trend to reestablish capital controls, which emerged after the capital market distortions observed during the Asian flu. In the present paper it is shown, that capital markets, while certainly prone to many distortions, are well capable of roughly guiding capital to the proper place. Though allocation is not model-like perfect, this steals the thunder from the idea, that closed or government guided capital markets were able to perform better.

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I Introduction

The discussion of the interest rate effects of capital movement restrictions has a long tradition. While it might first seem obvious, that capital controls allow for deviations from the interest rate parity, this is not necessarily true. E.g. Desai, Foley and Hines (2004) argue, that substitution effects between controlled and uncontrolled asset flows in conjunction with the fact, that at least major multinational enterprises have means to circumvent controls by inter-enterprise actions, are sufficient to cancel most of the impact of capital controls.

The main focus of the literature dealing with interest rates and capital movement restrictions is case based. Therefore few emphasis has been put yet into a more generalized analysis. However the specific capital account restrictions in Germany in the early 70s (Dooley/Isard, 1980), between Japan and the US (Ito, 1983 and 1987) and in Chile in the early 90s (Herrera/Valdés, 2001) are well discussed. This is surprising, because cross country and panel data studies concerning capital controls are en-vogue since the seminal works by Quinn (1997, 2000 and 2001), where capital controls where first measured quite detailed for a sufficiently large panel. Earlier papers where almost entirely based on a single dummy as a catch-it-all-variable for capital controls, which has been published in the Annual Report on Exchange arrangements and Exchange Restrictions by the IMF for several decades. The lack of detail in the data made it hard to prove any findings beyond political issues.[1]

[1] Especially the question, whether there is a general tendency to use or not to use financial market regulation is debated in this context(see e.g. Alesina, Grilli, Milesi-Ferretti (1993), where the authors were able to show the likeliness of capital controls being imposed under different regimes, but also found an annoying lack for any impact on growth that should intuitively exist). The presumably most quoted panel analysis is Rodrik's 2001 paper “Who needs capital account convertibility?”, where he believes to prove the lack of growth impact of financial openness using data, which is completely inadequate for panel analysis with such sophisticated questions.

The present paper attempts to use data on capital controls, where – according to the author's knowledge – for the first time a measurement of capital controls is used, which does not only distinguish between different control intensities in general (as Quinn and Gwartney, Lawson, 2003, do) but does so for different kinds of control separately for a broad range of countries.[2] Prime focus of the paper shall hence be, to discuss the interest differentials, which are possible – or sometimes not possible - due to different kinds of capital controls.

The rest of the paper is structured as followed. Section II discusses the data set employed. In section III the basic model, which shall be tested, will be derived. The final three sections discuss the empirical findings (sections IV and V) and the conclusions of these (section VI).

II The Data

(a) Measuring Capital Controls

Several obstacles make the empirical work with capital controls quite difficult, especially, when controls shall be analyzed for a broader choice of countries. First capital controls are quite often not implemented separated from other policies, which are relevant for the discussed dependent variables but as part of a larger political packet solution (see e.g. Forbes, 2004). However, this problem is only minor. The additional actions are usually going into the same political direction, i.e. liberalization or intervention. Therefore the worst distortion one might face is, that the results should not only be applied to capital movement controls but to controls as a whole. Secondly, when analyzing political variables it is quite common to distinguish "de jure" and "de facto" values of the tested variable. (For am more detailed discussion see Obstfeld, Shambaugh, Taylor, 2004, p. 9 f.) Luckily in the special case of capital controls large deviations of "de facto" from "de

[2] Nevertheless this has been done for single countries, as in Chung and Ni (2002) for Korea.

jure" controls seem unlikely, because controls – if not based on law – are hardly sustainable, for there are no options of daily capital control policy (without the need to change a law) which can be used to control, like this might be done with monetary policy for example.

Availability of data remains the fundamental problem. Empirical studies with the intention to include a broad range of countries or a long period have to rely on one dummy alone describing capital controls.[3] As said this measure is barely sufficient for most analysis. Many authors attempted to generate control indices, using additional information from the Annual Report on Exchange Arrangements and Exchange Restrictions. Quinn (1997) calculates a control intensity index for 61 IMF members from 1950 to 1989. The more detailed but less commonly used index by Gwartney and Lawson includes all IMF countries but only since 1970. A further critique of several approaches to measure control intensity is found in Eichengreen(2001)

Since 1996 the situation concerning data availability improved significantly. The IMF started to report capital controls divided by sector and transaction type. This allows to compile separate control indices based on the direction of the flows which are controlled and on the economic subjects who are controlled for over 170 countries. This makes it possible to analyze some central economic problems concerning capital flows, which are usually fruitless to be discussed without exactly this information.[4]

The following section shall show that not only the direction of capital flows matters, but that the economic subjects concerned are of vital importance, especially when outflow

[3] This statement refers to panel studies only. Studies which are only dealing with one country usually employ more detailed capital control measures as for example done in Goh(2005).

[4] Since 1996 the Gwartny-Lawson-Index is calculated as the share of uncontrolled sectors multiplied by 10. The more detailed information on the direction of capital flows which is not included in the table appendices is not included in the new index.

controls are discussed. Imagine outflow controls for locals. This does more or less close foreign markets for residents, giving the domestic capital markets an advantage. If the local situation is not so unpromising, that the local potential investors decide to cease investing, investment by local investors will shift from foreign markets to the domestic market. Outflow controls for foreigners, below labeled backflow controls, which have been used in Malaysia, are very different. Opposite to controls limiting the investment choice of locals, an outflow control hindering the outflow of capital invested by nonresidents, will probably reduce the total investment within the country. Investors from other countries will include the lock-in effect and the rising risk in their calculations and shift their investments to other competitor countries. To account for this problem but keep the number of variables manageable for the further analysis the following four classes of controls shall be distinguished: portfolio inflow controls, portfolio backflow controls, outflow controls on domestic capital and controls on direct investment within the country.[5] For each of the four categories control intensity is measured as the share of sectors controlled, multiplied by 10. Because the fdi-control-index is actually composed out of one dummy it can only switch between 0 and 10. Though it is rescaled to ease comparison with the effects of other controls.

After all it has to be resumed that certain distortions can never be prevented entirely. Though the fuzziness of a combination of indices like the one, which shall be used here, is distinctly smaller than the fuzziness of a single dummy due to the disaggregation of the data, there are still some minor gaps in the data. For example strictly upheld controls

[5] The kind of capital transaction real outflow controls (in the sense that they are applied to the outflow of domestic capital) is not a matter of class building here. As a matter of fact even portfolio capital that was subject to an outflow is more likely to be reorganized within the global capital market than being retransferred to the original country in the short run. Therefore it is no major concern what kind of investment leaves the country but if investments leaves the country at all.

in few markets might have a stronger impact than broadly employed controls which can easily be circumvented by means of derivative deals. [6]

(b) The Real Interest Rate

The OECD countries are the sample commonly employed in interest differential studies. Capital controls being significantly underrepresented in these highly industrialized nations makes a larger sample with a broader range necessary. Because the variety of investment instruments in some of the added countries is small compared to the OECD no specific kind of investment can be chosen for the representative rate of return.

For the purpose of the present paper therefore an unweighted geometrical average of deposit interest rate $r_{deposit}$ and credit interest rates r_{credit} as published by the Worldbank in the World Development Indicators in an annual sequence shall be employed as nominal interest rate. To calculate the real interest rate (r) the GDP deflator (π) (also used as published in the WDI) is used. Real interest therefore is calculated as:

$$(1+r)=\sqrt{\frac{(1+r_{deposit})(1+r_{credit})}{(1+\pi)}}$$

To compile the real interest rate that way, i.e. without regard to the exchange rate development is one of the advantages of the otherwise data-enforced annual period of the present analysis. Knowing that the (relative) purchasing power parity is roughly holding in the long run, inflation is entirely sufficient to adjust between real and nominal rates for national and international purposes.

[6] Notice that this is not a classical de-jure vs. de-facto comparison, where the question is, in how far certain rules are really enforced. The question is, whether rules can be circumvented. Because the search of alternatives usually carries its own costs, even circumvenable controls are hindering, meaning that the impact of this problem is only minor compared to a de-jure-de-facto-problem.

(c) The sample

The time horizon of the sample is restricted by the availability of adequate capital control data. Due to slight changes in the mode of report the dataset starts in 1997 reaching to 2003. For these seven years all 86 countries are analyzed, for which gdp deflator, interest rates and capital controls are reported for at least some years in the employed datasets. Additional to a broad range of middle income countries the sample includes 27 nations, which are classified rich, and 15 low income nations.

III The Model

Two problems have to be faced, if interest rates or interest rate differences shall be employed as indicators for capital market foreclosure, both of these have to do with risk.

The first problem is the correction for the risk premium that has to be paid by the analyzed economies. Central issues include inflation risk and country specific risk of default (which is only in cases of home currency denominated debt measuring roughly the same). All this does only apply, if one believes investors to act risk averse, that is, that the risk premium does exceed the expected losses from realized risks. Otherwise risk would only increase variance, hence decreasing significance and R^2.

The second problem is inflation itself. Inflation risk, when fulfilled, might cause a difference between expected real interest and the realized real interest rate. This might result in very low real interest rates in countries with surprisingly high inflation and vice versa, without this difference being caused by capital market foreclosure at all.

Therefore the interest rate model used, has to include this effect causing expected and realized values of the interest rate to diverge.

Real and nominal interest rates are connected by the following well known equation:

$$(1) \qquad 1+R_{t,i}=(1+r_{t,i})(1+\pi_{t,i})$$

$R_{t,i}$ being the geometrical average of deposit and credit interest rates in country *i* in period *t* and $\pi_{t,i}$ being the GNP deflator in country *i* in period *t*. However the nominal interest rate does not necessarily reflect the intended real interest rate, due to the already mentioned errors in inflation rate expectations. Much more the nominal interest rate in its origin is based on the following formula using ex ante variables.

(2) $$1+R_{t,i}=(1+r_{t,i}^{planned})(1+\pi_{t,i}^{expected})$$

Therefore $r_{t,i}^{planned}$ and $r_{t,i}$ are bound to diverge, if $\pi_{t,i}^{expected}$ and $\pi_{t,i}$ do.

For the present model two further assumptions are necessary. When the average difference between expectations and reality is zero, the average real interest rate of the low risk countries should equal the planned real interest rate for low risk assets. Therefore it is viable to assume that $\pi_{t,i}^{expected}-\pi_{t,i}$ is not correlated between different countries. Furthermore a fairly simple expectation model shall be employed, substituting inflation expectation by the inflation of the preceding period.

(3) $$r_{t,i}^{planned}=r_t^{avg}$$ (4) $$\pi_{t,i}^{expected}=\pi_{t-1,i}$$

r_t^{avg} is for this purpose defined as the unweighted average real interest rate of a set of OECD countries with especially few capital controls.

(3) and (4) inserted in (2), then equating with (1) leads to the following equation:

(5) $$\frac{(1+r_{t,i})}{(1+r_t^{avg})}=\frac{(1+\pi_{t-1,i})}{(1+\pi_{t,i})}$$

This is valid in the absence of capital market regulation of any kind or any other factors causing the real interest rate to diverge from its international optimum, like e.g. the existence of a homebias.

However capital market restrictions allow the domestic planed interest rate to differ from the global one. Additionally a way has to be found to integrate the distortion, which is caused by a risk premium. While rating agencies provide sovereign risk ratings, which are – due to their so called sovereign ceiling function – an often employed proxy for the risk of privates in a given economy, their employment proves difficult here. First of all not all countries are rated by all agencies, which limits the set of available countries quite substantially. Further the ratings often change quite fast within one year, making it quite hard to determine the risk for a given year. This is especially problematic because these changes are often done, after first risks have actually been realized. That is, that in many cases the paradox result might occur, that an effect, which should result in an increased risk premium, makes the real interest rate fall. And last but not least capital market foreclosure is increasing the risk of a fair share of assets of a country; hence it is very likely that there is a correlation between sovereign risk rating and the existence of some kinds of capital controls. Especially this last point makes the sovereign risk rating an unlucky choice for the present analysis.

Therefore other means have to be found to control for risk and other effects affecting the real interest rate. Here a set of income dummies shall be employed, based on the world banks division of countries in low, middle and high income groups. This is a way of at least catching the general risk (and its interest rate effects) of being on certain point on the scale of economic development without catching the effects of policy variables (like capital controls) as it would be likely when employing the otherwise more precise fixed effects for each country separately.

The econometric model to be tested here therefore is:

$$(6)\quad RDIFF_{t,i} = \begin{array}{l}\beta_0 INFDIFF_{t,i} + \beta_1 LOWINC_i + \beta_2 MIDINC_i + \beta_3 CMRINF_{t,i} \\ + \beta_4 CMROUT_{t,i} + \beta_5 CMRBCK_{t,i} + \beta_6 CMRFDI\ t,i + \varepsilon_{t,i}\end{array}$$

RDIFF is the natural logarithm of the interest rate differential, INFDIFF equals the natural logarithm of $\frac{1+\pi_{t-1,i}}{1+\pi_{t,i}}$. While it would be possible to test on actual and past inflation rates separately in the log form this seems unsuitable, due to the doubtlessly high correlation between the two time lagged inflation rates.[7] No constant is estimated because the interest rate of an industrialized country, with stable money markets, without capital controls actually should not (and usually does not) diverge from the mean of these countries. The reason that logs and not absolute values are used is, that total capital market foreclosure should impact interest rate differentials very strong compared to limited foreclosure due to the fact, that investment substitution becomes less likely.

Although this model builds on an interest rate parity it is not necessary for the model that the interest rate parity is perfectly holding. That capital market imperfections may drive away domestic interest rates from the global equilibrium even in countries without artificial restrictions to capital markets has for example been shown by Fraser/Taylor (1990) and Caporale, Pittis (1997). Nevertheless, if *natural* imperfections concerning the capital market are not systematically correlated with a special kind of capital market restrictions the resulting interest rate differentials which are not caused by *political* capital market imperfections are sufficiently randomly distributed and hence shouldn't distort the important results concerning the impact of capital controls.

IV The empirical findings

As it had to be expected the R^2 of the regression is rather low with 13%.[8] Nevertheless a result like that is neither problematic nor surprising, when dealing with economic vari-

[7] The correlation coefficient after Pearson between them is slightly above 75 percent.

[8] Full results are found in the appendix.

ables, where so many disturbances occur, without using the lagged variable or fixed effects as a major independent variable.

All variables, but the capital movement restrictions concerning FDI, have highly significant impact on the independent variable. As expected the sharply decreasing or increasing inflation is a major factor, when determining real interest rates. Income respectively development dummies are positive, which might be due to a risk premium as well as (or combined with) generally higher capital productivity in economies with a low capital stock (though the latter argument would be futile on perfect capital markets). The strongest impact among the control variables is shown by inflow controls. The lack of available capital caused by such controls in the concerned countries increases the cost of capital – and hence real interest rate – significantly. Vice versa outflow controls, increasing the available capital within the country, have the opposite effect of lowering the interest rate. The impact of *backflow* is about half as strong due to the unwelcome side effect of preventing capital entrance once employed. So one of the major drawbacks of backflow controls becomes obvious here quickly. While capital might be struck in the country short run, hence improving capital supply, the long run effect contradicts this result and limits the usefulness of this kind of control drastically. The lack of significance in the FDI-only controls had to be expected and is most likely primarily due to the ease of bypassing such controls by substituting it with portfolio investment. Although a certain share of controls is possibly evadable the clear significance of the other variables shows that they clearly affect the interest rate as one of the economic key variables.

In developing countries the impacts might even be larger, than suggested by this basic regression. A major part of the development dummies estimated in these countries might not be due to risk premium but to interest rate markups caused by capital controls, which are more frequently observed in these countries. The reason for this effect is taxes

do not affect winning and loosing situations symmetrically. Hence variance is not without impact on the expected value of the total returns as Herrera, Valdés (2001) shows.

A closer look at the analyzed data reveals that the measured impact of capital controls is almost entirely due to its effect in middle income countries. While the effects in rich economies as the OECD countries bear the right sign they are almost negligibly small and hence barely significant. While this matches the expected results, the poorest countries of the world do not show greater interest rate effects due to controls. The least developed countries are most likely exposed to such a variety and mass of economic shocks and political instability, that variables like capital controls do only account for a minor fraction of risk and rent considerations and are not of great importance.

V Some remarks on positive and negative interest rate differentials

It might seem unusual, that such a great lot of thought is given to interest rate differentials caused by capital controls. But it is fairly obvious that engaging in policies, which influence interest rates, means to tamper with investment which is strongly influencing long term growth chances. Attempts to increase the interest rate do almost certainly reduce investment. Capital controls attempting to do so try to sacrifice growth for stability. Nevertheless, countries, which find outflow restrictions highly attractive, are most certainly countries, experiencing massive capital outflows. They actually suffer from unrentable investment opportunities in their economies, which are causing the outflows. Knowing that a huge home bias exists, which makes domestic investment more likely than foreign investment even if there are no artificial restrictions to capital movements, it is quite clear, that the differentials in asset rentability are significant. Therefore capital controls, allowing the policy to sustain negative interest rate differentials compared to the big industrialized nations dominating the global capital market are not necessarily sufficient to improve investment. A rate of return, which is so low, that people wish to

invest outside the domestic economy enough for policy to react, indicates a situation, which is similar to the Keynesian investment trap. Domestic investors are more likely to substitute foreign investment with hoarding than with investment in the domestic economy. A first look at the 54 most outflow controlling countries in 2003 quickly reveals that almost each of these, is among the least developed countries of the world. While the entire OECD is part of the sample, one member (the Netherlands) is part of this highly controlling group. Interest rate changes due to outflow controls in these countries are possibly not caused by rising capital supply in the domestic economy but by the central bank's or government's attempts to lower interest rates under the international equilibrium rate, which is possible under the control regime. While the costs of this kind of capital control, namely the sacrifice of additional income due to the relatively higher international return on investments, do apply completely, the wished result of increasing capital supply domestically to force the economy on a higher growth path is arguable.

Although positive growth effects are unlikely, decreasing interest rates eases the financing of budget deficits. This might be an important, still working motivation for governments as mentioned by Wyplosz(1999)

VI Conclusions

The impact of capital controls on domestic capital market is stronger than one might have thought, knowing the seminal study of Feldstein and Horioka (1980), where the home bias has been discussed in some depth for the first time. Given the fact, that recent studies (e.g. by the Deutsche Bundesbank, 1997) show, that still today the home bias is strong even among only lightly controlling nations, the herein found results are even more alarming. Although even unrestricted capital markets are not fully integrated, the additional barriers in the form of capital controls have significant impact. That a fair share of capital movement restrictions is easily avoided by investors, does not prevent

strongly distorting effect on allocation. At least those economies, which do not have severely underdeveloped institutions, don't seem to be well advised, when trying to “protect” themselves by steering capital flows.

The intention of capital controls is to level the capital inflow and outflow peeks, hence lowering volatility of short term flows and therefore limiting the negative impact of investment “valleys”, which are not due to negative fundamentals but to speculative attacks (Tobin, 1978). At least the kind of capital controls, which is promoted by serious economic scientists does not have in mind, to hamper with the optimum allocation of capital or the global interest rate structure in a longer run. Nevertheless, this does not seem to be economic reality. It is almost unbelievable, that the impact of capital controls, remains restricted in this way, looking at the significant interest rate distortions caused. Given the differentials , which can be observed due to capital market restrictions, it is utterly impossible to deny, that there is a harmful amount of misallocation beyond the indented function of smoothing capital flows and restructuring their composure. This macroeconomic point of view does not even include other major drawbacks of capital market regulation like increased corruption. The proposal to reduce controls as much as possible (developed capital markets given) therefore can be made without having discussed direct growth impacts here.

VII References

Alesina, Alberto; Grilli, Vittorio; Milesi-Ferretti, Gian Maria (1993): The Political Economy of Capital Controls, NBER Working Paper 4353.

Caporale, Guglielmo; Pittis, Nikitas (1997): Domestic and external factors in interest rate determination, in: Applied Financial Economics, 7, pp. 465 – 471.

Chung, J.-H.; Ni, S. (2002): An empirical analysis on government capital controls and international capital flows in Korea, in: Applied Economics Letters, 9, 919 – 923.

Desai, Mihir A.; Foley, C. Fritz; Hines Jr., James R. (2004): Capital Controls; Liberalizations, and Foreign Direct Investment, NBER Working Paper 10337.

Deutsche Bundesbank (1997): Die Bedeutung internationaler Einflüsse für die Zinsentwicklung am Kapitalmarkt, in: Deutsche Bundesbank Monantsbericht Juli 1997.

Dooley, Michael P.; Isard, Peter (1980): Capital Controls, Political Risk and Deviations from Interest Rate Parity, in: Journal of Political Economy 88(2), pp. 370 – 384.

Eichengreen, Barry (2001): Capital Account Liberalization: What do Cross-Country Studies tell us?, in: The World Bank Economic Review 15(3), pp. 341 – 365.

Feldstein, Martin; Horioka, Charles Y. (1980): Domestic Savings and International Capital Flows, in: The Economic Journal 90(June 1980), pp. 314 – 329.

Forbes, Kristin J. (2004): Capital Controls: Mud in the Wheels of Market Discipline, NBER Working Paper 10284.

Fraser, Patricia; Taylor, Mark P. (1990): Some Efficient Tests of International Real Interest Parity, in: Applied Economics, 22(8), pp. 1083 – 1092.

Goh, Soo Khon (2005): New empirical evidence on the effects of capital capital controls in the composition of capital flows in Malaysia, in: Applied Economics 37(13), pp. 1491 – 1503.

Gwartney, James; Lawson, Robert (2003): Economic Freedom of the World: Annual Report 2003, Toronto.

Herrera, Louis O.; Valdes, Rodrigo O. (2001): The effect of Capital Controls on Interest Rate Differentials, Journal of International Economics 53(2), pp. 385 - 398.

Ito, Takatoshi (1983): Capital Controls and the Covered Interest Parity between the Yen and the Dollar, CER Discussion Paper Nr. 83-180.

Ito, Takatoshi (1987): Capital Controls and the Covered Interest Parity, NBER Working Paper 118.

Obstfeld, Maurice; Shambaugh, Jay C.; Taylor, Alan M. (2004): The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility, NBER Working Paper 10396.

Quinn, Dennis P. (1997): The Correlates of Change in International Financial Regulation, in: American Political Science Review 91(3), S. 531 – 551.

Quinn, Dennis P. (2000): Democracy and International Financial Liberalization, Working Paper.

Quinn, Dennis P.; Woolley, John T.: Democracy and National Economic Performance: The Preference for Stability, in: American Journal of Political Science 45(7), pp. 634 – 657.

Rodrik, Dani (1998): Who needs Capital-Account Convertibility?, in: Kenen, Peter B., et. al.: Should the IMF Pursue Capital-Account Convertibility, New Jersey.

Tobin, James (1978): A Proposal for an International Monetary Reform, in: Eastern Economic Journal 4(3-4), pp. 153 – 159.

Wyplosz, Charles (1999): Financial Restraints and Liberalizion in Postwar Europe, CEPR Discussion Paper No. 2253.

Appendix: Result tables

Table 1: Full sample

(Dependent Variable: RDIFF)

	Non-standardized Coefficients		Standardized Coefficients	T	Significance
	β	Standard Error			
INFDIFF	,307	,061	,216	5,004	,000
LOWINC	,052	,016	,148	3,254	,001
MIDINC	,033	,008	,222	3,872	,000
CMR_IN	,011	,003	,440	3,826	,000
CMR_OUT	-,009	,002	-,430	-4,234	,000
CMR_BACK	-,005	,002	-,290	-2,832	,005
CMR_FDI	-,001	,001	-,070	-1,188	,235

R	R-Square	Adjusted R-Square	Standard error of estimator
0,38	,142	,130	,10385

Table 2: Middle income sample

(Dependent Variable: RDIFF)

	Non-standardized Coefficients		Standardized Coefficients	T	Significance
	β	Standard Error			
INFDIFF	,231	,090	,143	2,559	,011
MIDINC	,070	,014	,508	5,058	,000
CMR_IN	,015	,005	,497	3,124	,002
CMR_OUT	-,012	,004	-,509	-3,180	,002
CMR_BACK	-,010	,003	-,439	-3,127	,002
CMR_FDI	-,004	,002	-,216	-2,384	0,02

R	R-Square	Adjusted R-Square	Standard error of estimator
,432(b)	,186	,168	,12579